

Having, thus, described the invention, what is claimed is:

1 1. An apparatus for placing a circular end cap on a cylindrical workpiece, comprising:
2 a stationary support base;
3 a guide member which is fixedly attached to the stationary support base and which
4 comprises a ramp;
5 a movable push bar;
6 a spacer which is operatively attached to said push bar for concurrent movement
7 therewith;
8 an emplacement applicator, comprising:
9 a back plate, having an upper part and a lower part having a post operatively
10 attached thereto, said post being disposed proximate said ramp;
11 a flange affixed to the lower part of said applicator back plate, said flange
12 being pivotally attached to said spacer at a pivot connection;
13 said emplacement applicator further comprising an end cap clamping jig operatively
14 attached to the upper part of said applicator plate;
15 wherein linear inward movement of said push bar, from a first position to a second
16 position, moves the post up the ramp, causing said applicator plate to pivotally move around
17 said pivot connection, from a substantially horizontal orientation to a substantially vertical
18 orientation thereof.

1 2. The apparatus of claim 1, wherein said end cap gripping jig comprises a plurality of

2 arcuate segments which cooperate to form a circular hollow therebetween, when placed in
3 end-to-end contact with one another;
4 wherein each of said arcuate segments is radially reciprocally movable with respect to
5 said circular hollow.

1 3. The apparatus of claim 2, wherein each of said arcuate segments has a groove
2 formed in an inner surface thereof, to receive an end cap edge portion.

1 4. The apparatus of claim 2, wherein said arcuate segments are provided with tapered
2 inner edges, for forcing a circumferential edge of a workpiece inwardly as the segments are
3 forced therepast.

1 5. The apparatus of claim 2, wherein said end cap clamping jig comprises at least
2 three segments.

1 6. The apparatus of claim 1, further comprising a servo motor for moving said push
2 bar.

1 7. The apparatus of claim 1, wherein said guide member comprises a first upstanding
2 guide plate, attached to the stationary support member and having a first guide groove
3 formed therein.

1 8. The apparatus of claim 7, wherein said first guide groove comprises a substantially

2 horizontal first section, a second section which extends upwardly at an angle from said first
3 section and which defines said ramp therebelow, and a substantially horizontal third section.

1 9. The apparatus of claim 7, wherein said guide member comprises a second
2 upstanding guide plate, attached to the stationary support member and having a second guide
3 groove formed therein and facing toward the first guide groove.

1 10. The apparatus of claim 1, wherein said emplacement applicator comprises a drive
2 plate for connecting to said push bar, and wherein said spacer is affixed to said drive plate.

11. The apparatus of claim 1, wherein said gripping jig is adapted to be
pneumatically actuated.

12. The apparatus of claim 6, further comprising a threaded shaft attached to said
servo motor, and wherein said push bar is threadably connected to said threaded shaft for
movement thereby.

13. An end cap installation station, comprising a first placement apparatus which is
the apparatus of claim 1, the first placement apparatus constructed and arranged to have a
push bar thereof move in a first direction during placement of an end cap on a workpiece;
said end cap installation station further comprising a second placement apparatus
which is substantially identical to the first placement apparatus and oriented to substantially
mirror said first placement apparatus,

7 wherein said first and second placement apparatus share a common stationary support
8 member, and wherein said second placement apparatus is configured, constructed and
9 arranged to have a push bar thereof move in a second direction during placement of an end
10 cap on a workpiece,
11 wherein said second direction is substantially opposite said first direction.

1 14. A method of applying an end cap to a cylindrical filter element having a
2 longitudinal axis, comprising the steps of:
3 a) supporting a cylindrical filter element at a central portion thereof;
4 b) grasping a first end cap with a clamping jig of a first end cap application apparatus,
5 said application apparatus comprising a back plate;
6 c) positioning the filter element adjacent said end cap application apparatus; and
7 d) pivotally moving said applicator back plate around a pivot connection, causing said
8 plate to move from a substantially horizontal orientation to a substantially vertical orientation
9 thereof, to force said end cap in covering relation over a first end of said filter element.

1 15. The method of claim 14, further comprising a step of applying a second end cap to
2 a second end of said filter element with a second end cap application apparatus which is
3 substantially similar to said first end cap application apparatus.

1 16. The method of claim 15, wherein both end caps are simultaneously applied to said
2 filter element.

1 17. The method of claim 14, wherein each of the arcuate segments of the end cap
2 clamping member comprises a tapered edge on an inner surface thereof, and wherein said
3 tapered edge forces a circumferential outer edge of a filter element inwardly during step d) as
4 said tapered edge is moved past said filter element outer edge.

1 18. The method of claim 14, wherein said end cap applicator apparatus comprises a
2 flange attached to a lower part of said back plate and a cam follower bearing attached to said
3 flange and extending outwardly thereon, and wherein said cam follower bearing is moved up
4 a ramp during step d).

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